

Sample Specification Guideline for Installing a Polished Concrete System Using **Rapid Set[®] TRU[®] PC**

SECTION 03 35 53 POLISHED CONCRETE TOPPING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including general and supplementary conditions apply to this section.

1.2 SUMMARY

- A. Section includes:
 - 1. A Rapid Set[®] TRU[®] PC Polished Concrete Topping finished to a specified finish using traditional dry concrete polishing techniques.
 - 2. Application of a primer coat using Rapid Set TXP™ Epoxy Primer.
 - 3. Application of latex-based grout coat Husqvarna GM 3000™.
 - 4. Furnish all labor, materials, equipment and services necessary for the dry diamond grinding and polishing of the Rapid Set TRU PC floor in accordance with industry recommended standards.
 - 5. Application of Metzger/McGuire semi-rigid joint filler to fill and protect joints.
 - 6. Application of Husqvarna Hiperfloor[®] densifiers and impregnating stain guard to inhibit absorption of liquid into the surface, thereby minimizing the potential for discoloration due to staining and etching.

1.3 REFERENCES

- A. ASTM C109 – Standard Test Method for Determining the Compressive Strength of Hydraulic Cement Mortars using 2 inch or 50 mm Cube Specimens.
- B. ANSI 101 – Standard Test Method for Determining the Static Coefficient of Friction of Polished Concrete and Other Like Surfaces
- C. ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- D. ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- E. ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in-situ Probes.
- F. ASTM E430 – Standard Test Methods for Measurement of Gloss of High-Gloss Surface by Abridged Goniophotometry.
- G. CSDA ST 115 Standard for Concrete Surface Roughness Average
- H. ACI 302. R-04 – Guide for Concrete Floor and Slab Construction.

1.4 SUBMITTALS

- A. Submit the following in accordance with Division _____ Section “Submittal Procedures”.
- B. Product data for the Rapid Set® TRU® PC to include physical characteristics, product limitations, and manufacturer’s installation instructions to include recommended mix designs for the intended application.
- C. Product data for the Rapid Set LevelFlor®, Rapid Set Cement All® and Rapid Set Concrete Mix to include physical characteristics, product limitations, manufacturer’s installation instructions to include recommended mix designs for the intended application.
- D. Product data for Metzger/McGuire Rapid Refloor Low Viscosity Structural Urethane surface repair material, Metzger/Mcguire Spal-Pro RS 88 Semi-Rigid Polyurea Joint Filler or MM-80 Semi-Rigid Epoxy Joint Filler.
- E. Product data for Husqvarna GM 3000™ grout compound.
- F. Product data for Husqvarna Hiperfloor® densifier, and stain protector/guard to include product limitations and manufacturer’s instructions for installation.
- G. Third Party audit data proving diamond tool certification with CSDA ST 115.
- H. Installer Qualifications — Provide project names, addresses, contact names, phone numbers of at least three (3) projects of similar scope completed by the installer.
- I. Maintenance procedures for cleaning and maintaining the surface of the finished installation to include cleaning and polishing equipment and the use of Diamond Cleaning Pads with water for maintenance.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Installer must be trained and certified by all manufacturers:
 - 1. A TRU Trained Applicator is one that has been trained in the methods of placing and polishing concrete toppings.
 - 2. A TRU Premier Level One applicator is one that has been trained in the methods of placing and polishing concrete toppings and has a minimum of five (5) years company experience in finished floor installations, and at least 20 finished floor installations greater than 5,000 sq. ft.
- B. CTS Cement recommends the installer have a minimum of 10 projects performed within three (3) years of similar type, size and complexity as this contract.
- C. Manufacturer’s Training Course Completion: Provide a letter of training completion from CTS Cement and all equipment and material manufacturers confirming that the installer is a trained applicator and is familiar with proper procedures and installation requirements recommended by the manufacturer.
- D. Manufacturer to provide confirmation of installation procedures.
- E. Place a field sample (mock up) of Rapid Set TRU PC Polished Concrete, surface repair materials, and all other finishes to the required specification of the finished floor. Accepted field sample shall remain in place and shall be the guide to acceptance of the balance of installation.
- F. Field sample must also include specified edge finish, which must be specified and approved by the architect/owner’s representative since edge-grinding procedures may not produce the exact same finish as the field.
- G. Prior to the installation of the Rapid Set Polished Concrete System, an on-site meeting shall be organized to review specification requirements. Attendees to include the Owner, Architect, General Contractor, Subcontractor, and Rapid Set representative.

1.6 ENVIRONMENTAL LIMITATIONS/REQUIREMENTS

- A. Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting product performance.
- B. Flatness and levelness:
 - 1. Installed and finished topping shall meet flatness and levelness requirements as specified.
 - 2. Installed topping shall be cured a minimum of four (4) hours or at which point equipment can be put on the slab and does not cause indentation.
- C. General Contractor shall protect areas to receive polished concrete topping at all times during construction to prevent oils, dirt, metal, excessive water and other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured:
 - 1. All hydraulic-powered equipment shall be diapered to avoid staining of the concrete.
 - 2. All vehicle parking shall be prohibited on the finished slab area.
 - 3. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
 - 4. No pipe-cutting machine shall be used on the finish floor slab.
 - 5. Steel shall not be placed on the finish slab to avoid rusting.
 - 6. Acids and acidic detergents will not come in contact with slab.
 - 7. All painters will use drop cloths on the concrete. If paint gets on the concrete, it must be immediately removed.
 - 8. All trades will be informed that the slab must be protected at all times.
- D. Installed topping area shall be closed to traffic during finish floor application and after application for the length of time recommended by the manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in original containers.
- B. Maintain records of manufacturer's product lot numbers.
- C. Store all materials in a dry, climate-controlled environment at a minimum of 60°F and a maximum of 80°F.

1.8 SITE CONDITIONS

- A. Rapid Set[®] TRU[®] PC is a hydraulic cement-based topping. The ideal temperature at time of installation is 70°F for both the surface and ambient air. Warmer material will set faster than expected and cooler material will have slower strength gain. Control the mix temperature by protecting the bags of TRU PC from temperature extremes and adjust the mix temperature by using hot or cold water. For further information contact CTS Cement at 800-929-3030.
- B. Existing concrete must have a minimum compressive strength of 3000 psi and a minimum density of 100 pcf (pounds per cubic foot).
- C. Close off areas during the installation of TRU PC from all traffic and stop excessive air movement across the top of the surface until TRU PC has reached final set. See 1.6 (C) for protecting the polished topping.
- D. Moisture Vapor and Alkalinity Testing:
 - 1. No Moisture Vapor Transmission Barrier is required when the Rapid Set TXP™ Epoxy Primer is placed in accordance with manufacturer's instructions.
 - 2. Rapid Set TXP will remain unaffected by Moisture Vapor Transmission and alkalinity up to pH 14.
 - 3. Please contact the CTS Cement Technical Department at 800-929-3030 for technical

information or guidelines for applications that will not involve polishing as the finished surface.

PART 2 – PRODUCTS

2.1 INSTALLATION MATERIALS

- A. Concrete Repair Materials and Toppings
 1. Polished Concrete Topping shall be Rapid Set® TRU® PC Polished Concrete.
 2. Primer shall be Rapid Set TXP™ Epoxy Primer
 3. Wide area surface repairs shall be from one of the following products:
 - a) Rapid Set TRU Self-Leveling (0.25-1.5" depth neat, 5" depth extended)
 - b) Rapid Set LevelFlor® Self-Leveling Underlayment (0.25"-1.0" in depth neat, 5" extended)
 4. Surface defect material shall be from one of the following products:
 - a) Rapid Set TRU Self-Leveling (0.25-1.5" depth)
 - b) Rapid Set LevelFlor Self-Leveling Underlayment (0.25-1.0" depth)
 - c) Rapid Set Cement All® (0-4" depth)
 - d) Rapid Set Mortar Mix (0.5-6" depth)
 - e) Rapid Set Concrete Mix (2-24" depth)
 - f) Rapid Set® TXP™ Epoxy Primer (1 part TXP to 1.5 parts silica sand)
 - g) Metzger/McGuire Rapid Refloor®
 5. Water shall be clean and potable.
 6. Integral color shall be liquid pigment only. Contact CTS Cement for approved color manufacturers.
- B. Concrete Chemical Treatments
 1. Densifier to be _____
 2. Stain Guard to be _____
- C. Joint and Crack Filler Materials
 1. Saw Cut Contraction/Construction Joint Filler and Crack Filler shall be one of the following, depending upon site conditions and at the discretion of the installation contractor:
 - a) Metzger/McGuire Spal-Pro RS 88 Semi-Rigid Polyurea Joint Filler.
 - b) Metzger/McGuire MM-80®/MM-80P Semi-Rigid Polyurea Joint Filler.
 - c) Metzger/McGuire Rapid Refloor.
 2. Color to match adjacent finished floor surface.
- D. Aggregate Materials and Design Features
 1. Special aggregates and design feature strips shall be as agreed to by the designer and the installer and shall be within recommended guidelines of the manufacturer.

2.2 POLISHING EQUIPMENT

- A. Polishing Equipment
 1. Three-phase 480 volt generator and step-down transformer or have certified electrician wire to house power through distribution boxes or transformers.
 2. Husqvarna Dual-Drive Technology™ grinder with fully independent speed and direction control of plate and satellite heads; minimum 740 pounds down pressure.
 3. Dust extraction system, pre-separator and squeegee attachments with minimum flow rating 580 cubic feet per minute and phase correction.
 4. Hand grinder with dust extraction attachment and pads.
 5. Husqvarna RediLock™ diamond tooling.

6. Or equivalent planetary polishing equipment.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Installer shall examine and approve concrete substrate for conditions affecting performance of finish. Installer shall correct conditions that are found to be out of compliance with the requirements of this section to include installing a pre-leveling layer as recommended by CTS Cement Manufacturing Corporation.
- B. All surface defects shall be repaired using materials described in 2.1 A.
- C. All joints and cracks shall be repaired using the material described in 2.1 C.
- D. Provide a concrete substrate surface that has been mechanically prepared to a ICRI CSP 3 and is clean of all contaminants and debris.
- E. If application includes divider/terrazzo strips, level and set strips to appropriate heights prior to the pour of the Rapid Set[®] TRU[®] PC.
- F. Pin or otherwise mark all existing joint locations to ensure they can be located and re-saw cut after placement of topping.
- G. Prime the prepared concrete using Rapid Set TXP[™] Epoxy Primer in accordance with manufacturer's recommendations and time restrictions.
- H. Broadcast washed and dried angular cut silica sand onto Rapid Set TXP Epoxy Primer prior to initial set. Broadcast to refusal.
- I. After epoxy primer cures, vacuum up all loose silica sand.

3.2 APPLICATION TRU PC

Install Rapid Set TRU PC in accordance with manufacturer's instructions to include careful monitoring of the amount of mix water being used, with allowance for the following special designs:

- A. Any aggregates used and the loading shall be as recommended and approved by the topping manufacturer.
- B. Integral color shall be approved by CTS Cement Manufacturing Corporation.
- C. Specified color to be _____.
- D. Batch mixers by CS Unitec (Hippo Mixer) or Strong Manufacturing are the preferred methods of mixing TRU PC for polished overlays.
- E. If Barrel Mixing, use a 1/2" heavy-duty drill (12 mm) with a minimum of 650 rpm. Mix two (2) bags of TRU PC with the specified amount of water in a mixing barrel using a "helix style" mixing paddle. Mix thoroughly for 3-5 minutes to obtain a lump-free mixture.
- F. Clean barrels/mixers periodically to remove any unmixed and/or hardened material prior to placing the mixed TRU PC onto the floor.
- G. Place TRU PC to grade levels required and to conform to details on drawings.
- H. The minimum installation thickness for the Rapid Set TRU PC Polished Concrete Topping shall be 3/8". For fork lift traffic areas nominal thickness shall be no less than 1/2". Refer to the Technical Bulletins or contact CTS Cement Manufacturing for more information.
- I. For wide area repairs that require thicknesses greater than 1.0" with Rapid Set LevelFlor[®] and greater than 1.5" with Rapid Set TRU Self-Leveling, washed pea gravel may be added to reduce material costs. Mix the material with water first then extend each 50-pound bag with up to 25 pounds of clean 3/8" pea gravel. Place the extended

material to $\frac{3}{8}$ " – $\frac{1}{2}$ " below the desired floor elevation and then place Rapid Set® TRU® PC to the finished floor elevation. Allow the pre-leveling course to dry for 12-16 hours.

- J. Pour or pump the Rapid Set TRU PC and spread in place with a gauge rake set at the appropriate thickness. Use the Rapid Set Spike Roller to coax the material into place. Use rounded metal spiked shoes to avoid damaging the primer. Contact the CTS Cement Technical Department if other tools are required.

3.3 JOINT SAWING, PREPARATION AND FILLING

- A. Allow topping to cure for a minimum of four (4) hours prior to saw cutting joints.
- B. Joints shall be installed prior to the Polishing Process.
- C. Saw blade shall be non-debris compacting, upturning blade; Husqvarna Professional® Slinger blade for joint cleaning.
- D. Locate original joint locations and saw cut through topping into the original joint. Saw blade shall penetrate to depth of original joint or 2" deep, whichever is the lesser.
- E. Ensure saw-cut joint is completely free of dust/debris/laitance.
- F. Apply stain prevention film or other masking agent along surface on both sides of the joint if residual staining may be a concern.
- G. Install joint filler. Fill from bottom of joint, being careful to avoid entrapping air.
- H. Slightly overfill joint to a crowned profile.
- I. After sufficient cure, razor excess filler, leaving a filler profile which is flush with floor surface.
- J. If filler profile is low/concave, remove top 1/2" of filler and re-apply.

3.4 POLISHING PROCESS FOR TRU PC

- A. Allow topping to cure for a minimum of 24 hours before beginning the polishing process.
- B. Use Husqvarna HiperFloor polishing system. The first metal step of the grinding process is based on the overall flatness of the pour or if the Rapid Set TRU PC had aggregates broadcasted or extended integrally in the mix.

Metal Step

1. 60 grit metal bonded diamonds.
2. 120 grit metal bonded diamonds, used in conjunction with Husqvarna GM3000™.

Transition Step

3. 100 Grit ceramic bonded pads.

Resin Step

4. 200 Grit 10" resin bonded flex polish pad.
5. 400 Grit 10" resin bonded flex polish pad.
6. 800 Grit 10" resin bonded flex polish pad (if desired shine is necessary).
7. 1800 Grit 10" resin bonded flex polish pad (if desired shine is necessary).
8. 3000 Grit 10" resin bonded flex polish pad (if desired shine is necessary).

- C. Refer to the CTS Cement Technical Bulletins for more information.

3.5 PROTECTION

- A. Protect the finished surfaces from damage and soiling and other construction activities.
- B. Provide protective cover without damaging the polished surface.
- C. Don't allow standing water, rubber matting, or other non-breathable objects onto the polish surface for a period of 72 hours after final surface treatment.

3.6 SHEEN

- A. Polished Concrete Level 1:
 1. At a distance of 100 feet, the floor will reflect images from side lighting.
- B. Polished Concrete Level 2:
 1. At a distance of 30 to 50 feet, the floor will clearly reflect from side and overhead

lighting.

C. Polished Concrete Level 3:

1. Looking straight down, the floor will clearly reflect overhead and side light, with the appearance of the floor looking wet.